

WE CLAIM:

1 1. A method for improving the performance of a golf club, comprising the steps of:
2 fabricating a golf club head having a face;
3 friction stir processing a predetermined area of the surface of the golf club face;
4 and
5 re-surfacing at least the predetermined area subjected to friction stir processing so
6 as to provide a desired surface topology.

1 2. The method of Claim 1, wherein the golf club head comprises a metal selected
2 from the group consisting of aluminum, titanium, nickel, copper, iron, and alloys thereof.

1 3. The method of Claim 1, wherein said step of fabricating includes a step of casting
2 or forging.

1 4. The method of Claim 1, wherein said step of friction stir processing is performed
2 using a FSP tool rotating at a rate between 150 and 2000 rotations per minute.

1 5. The method of Claim 1, wherein said step of friction stir processing is performed
2 using a FSP tool moved along the workpiece surface at a rate of 50 to 7000 mm/minute.

1 6. The method of Claim 1, wherein said step of re-surfacing includes a step of
2 milling.

1 7. The method of Claim 1, wherein the desired surface topology includes at least one
2 groove.

1 8. A method for improving the performance of a golf club, comprising the steps of:
2 friction stir processing a predetermined area of the surface of a metallic
3 workpiece; and
4 fabricating a golf club head having a face which includes the predetermined area.

1 9. The method of Claim 8, wherein the metallic workpiece comprises a metal
2 selected from the group consisting of aluminum, titanium, nickel, copper, iron, and alloys
3 thereof.

1 10. The method of Claim 8, wherein the metallic workpiece has a shape selected from
2 the group consisting of strip, plate and block.

1 11. The method of Claim 8, wherein said step of fabricating includes a step of
2 forging.

1 12. The method of Claim 8, wherein said step of friction stir processing is performed
2 using a FSP tool rotating at a rate between 150 and 2000 rotations per minute.

1 13. The method of Claim 8, wherein said step of friction stir processing is performed
2 using a FSP tool moved along the workpiece surface at a rate of 50 to 7000 mm/minute.

1 14. The method of Claim 8, further comprising the step of:
2 re-surfacing at least the predetermined area subjected to friction stir processing so
3 as to provide a desired surface topology.

1 15. The method of Claim 14, wherein the step of re-surfacing is performed before the
2 step of fabricating.

1 16. The method of Claim 14, wherein the step of re-surfacing is performed after the
2 step of fabricating.

1 17. The method of Claim 14, wherein the desired surface topology includes at least
2 one groove.

1 18. A golf club with improved performance, comprising a head with a face, said face
2 comprising friction stir processed metal.

1 19. The golf club of Claim 18, wherein said friction stir processed metal is selected
2 from the group consisting of aluminum, titanium, nickel, copper, iron, and alloys thereof.

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